Opto-Mechanical Design

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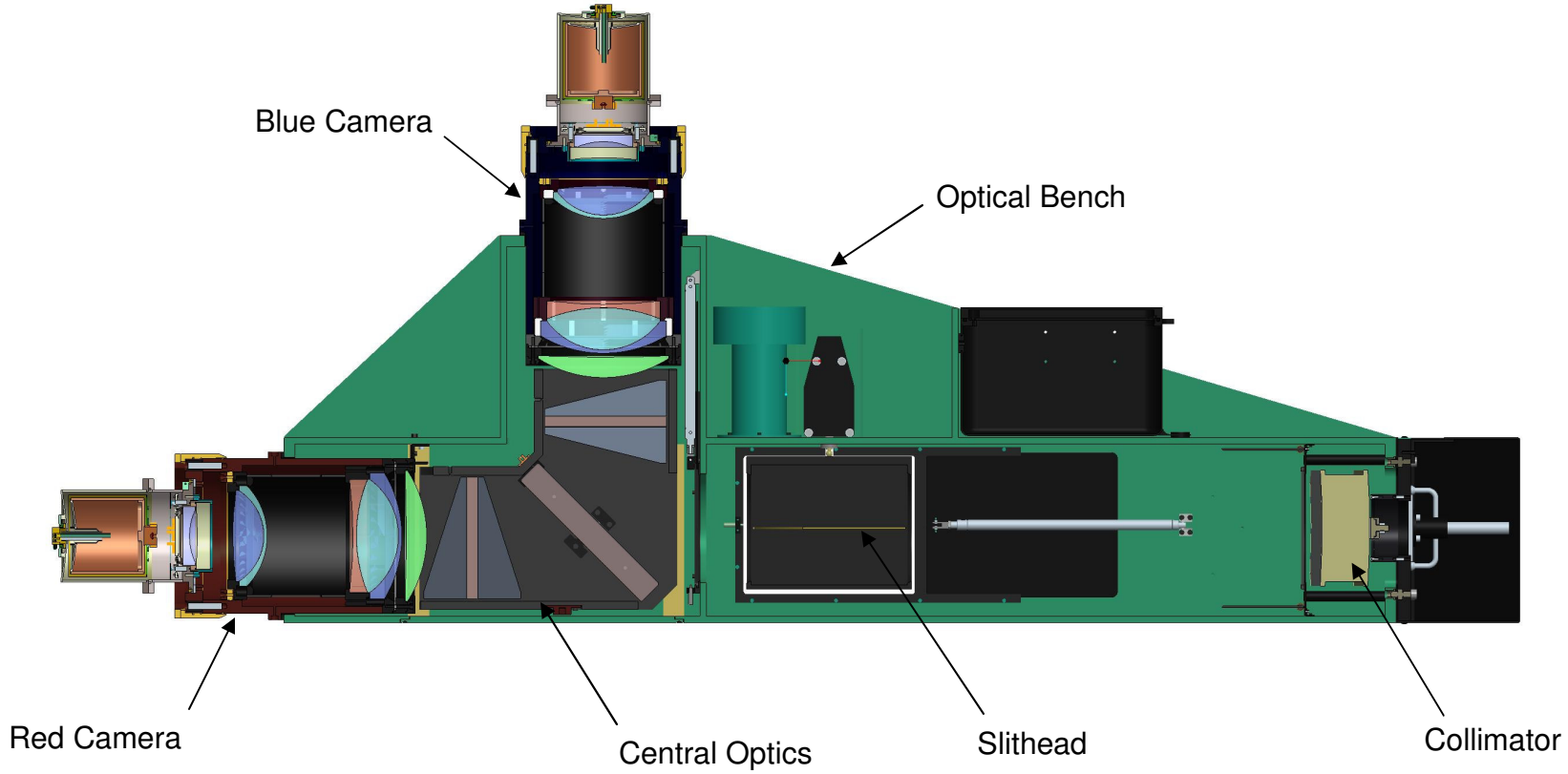
Opto-Mechanical Layout

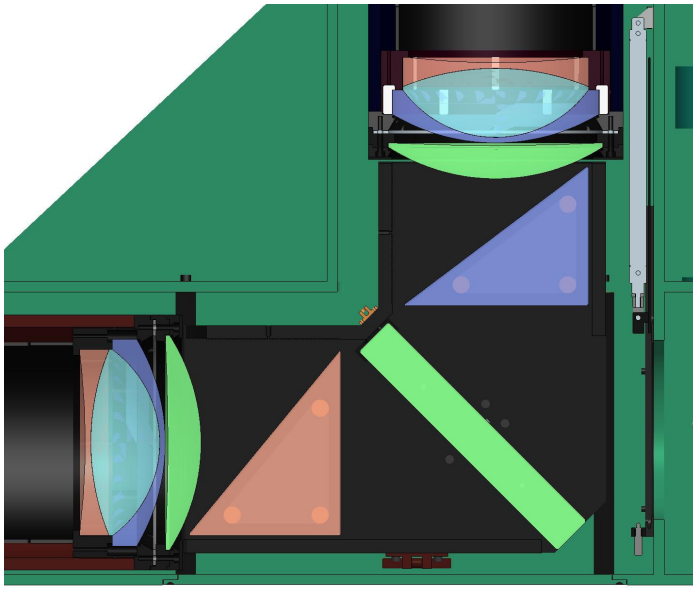


BOSS Opto-Mechanical Upgrades

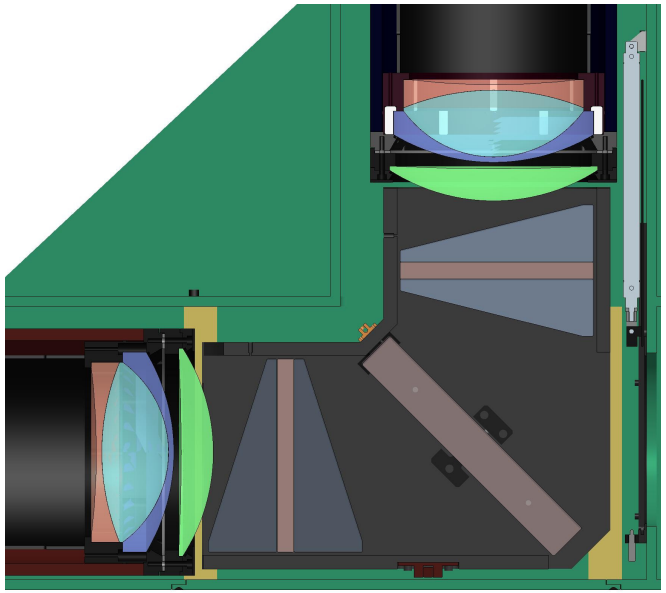
- **Central Optics**
  - Complete rebuild to accommodate VPH grisms
  - Same basic design
  - Slightly larger in size
  - 15% heavier than the SDSS design
- **Cameras**
  - New dewars (Princeton et al.)
  - Triplets to be re-coupled in advance of BOSS upgrades
  - New singlet cell to accommodate spacing change
  - Spacing change between the triplet and doublet requires a new inner barrel
- **Slithead (UW)**
  - More fibers
  - Smaller fibers

Central Optics Old vs. New

SDSS



BOSS



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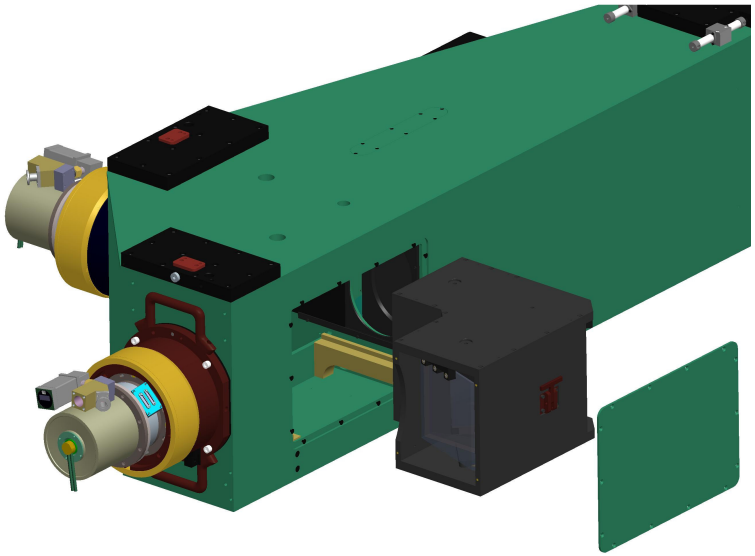
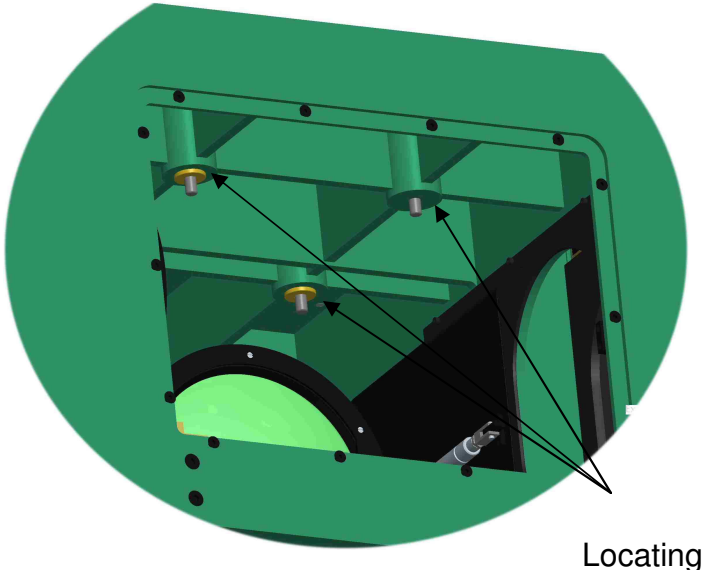
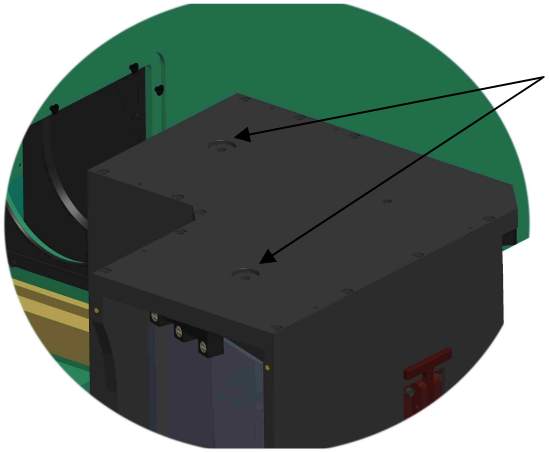
Central Optics Installation





Locating Features



Locating Features

Central Optics is mounted on three machined posts, aligned by two dowels. Three bolts fasten the assembly to the bench.

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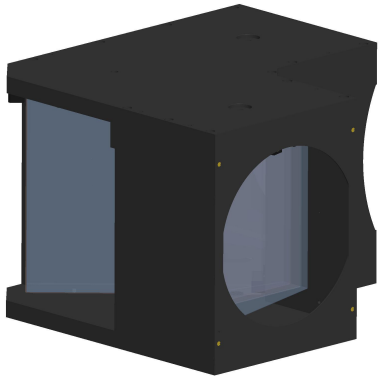
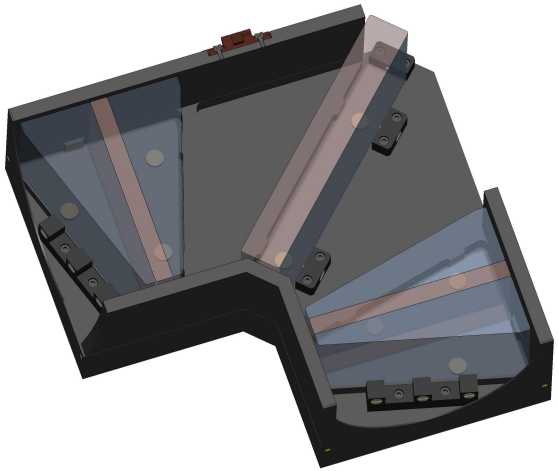
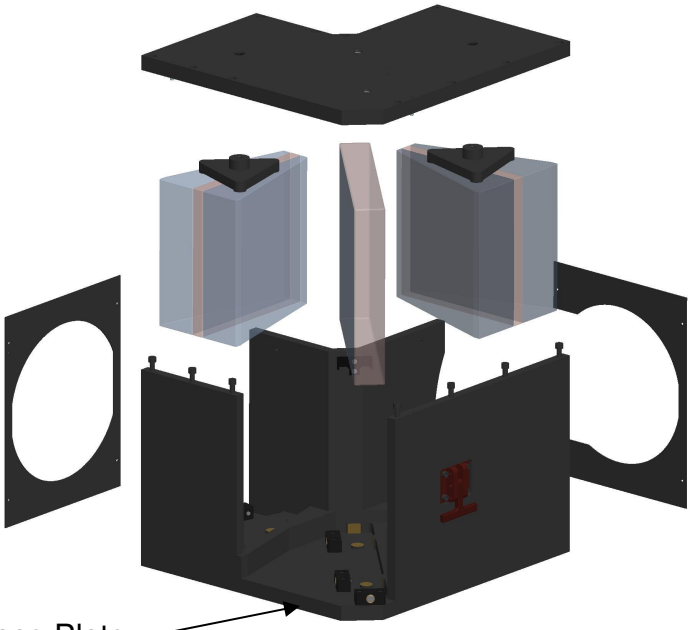
Central Optics Opto-Mechanical Design



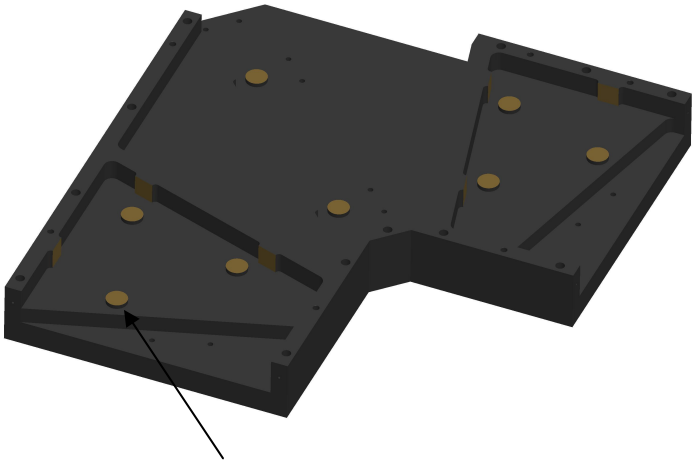




The goal is to mount each optic kinematically to a common reference, the base plate.

Grism Mount

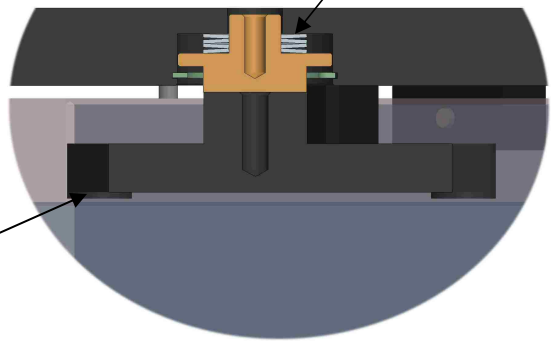
Each optic is kinematically mounted using six hard points



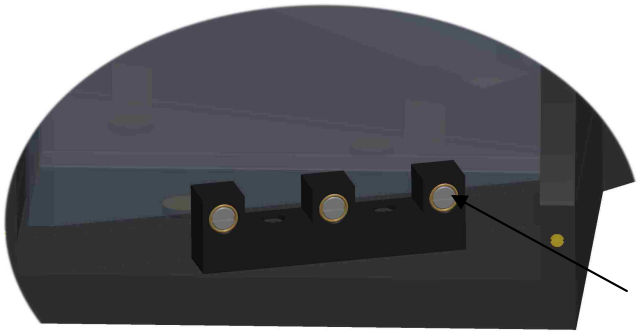
(6X) Hard Point

Spring plunger seats grism to primary datum

Belleville Washers



(3X) Bonded Joint



Spring plungers seat grism to secondary and tertiary datums

(3X) Spring Plungers

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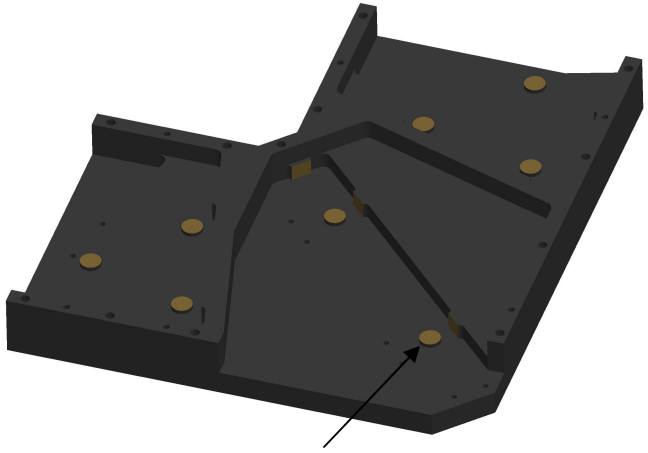
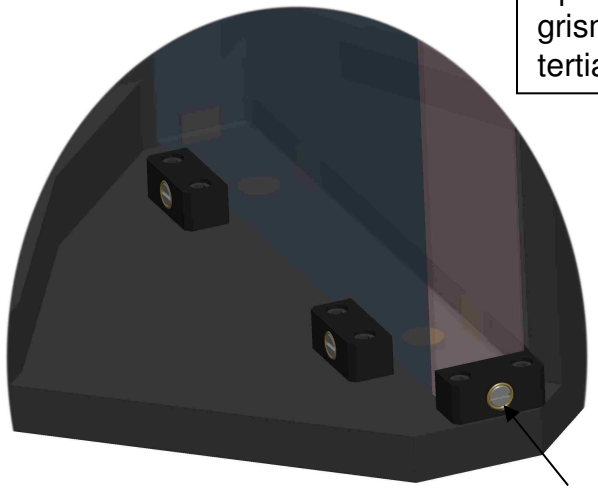
Dichroic Mount



(5X) Hard Points

Spring plungers seat grism to primary and tertiary datums

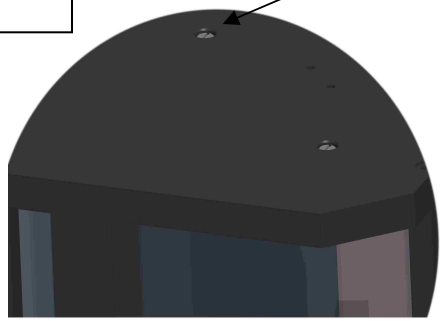


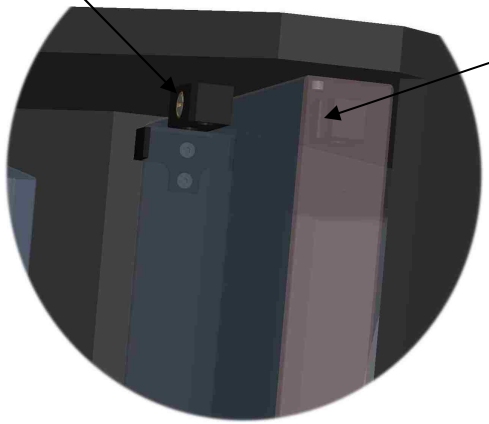
Spring Plunger

(3X) Spring Plungers

Spring plunger seats grism to secondary datum

(2X) Spring Plunger





Hard Point

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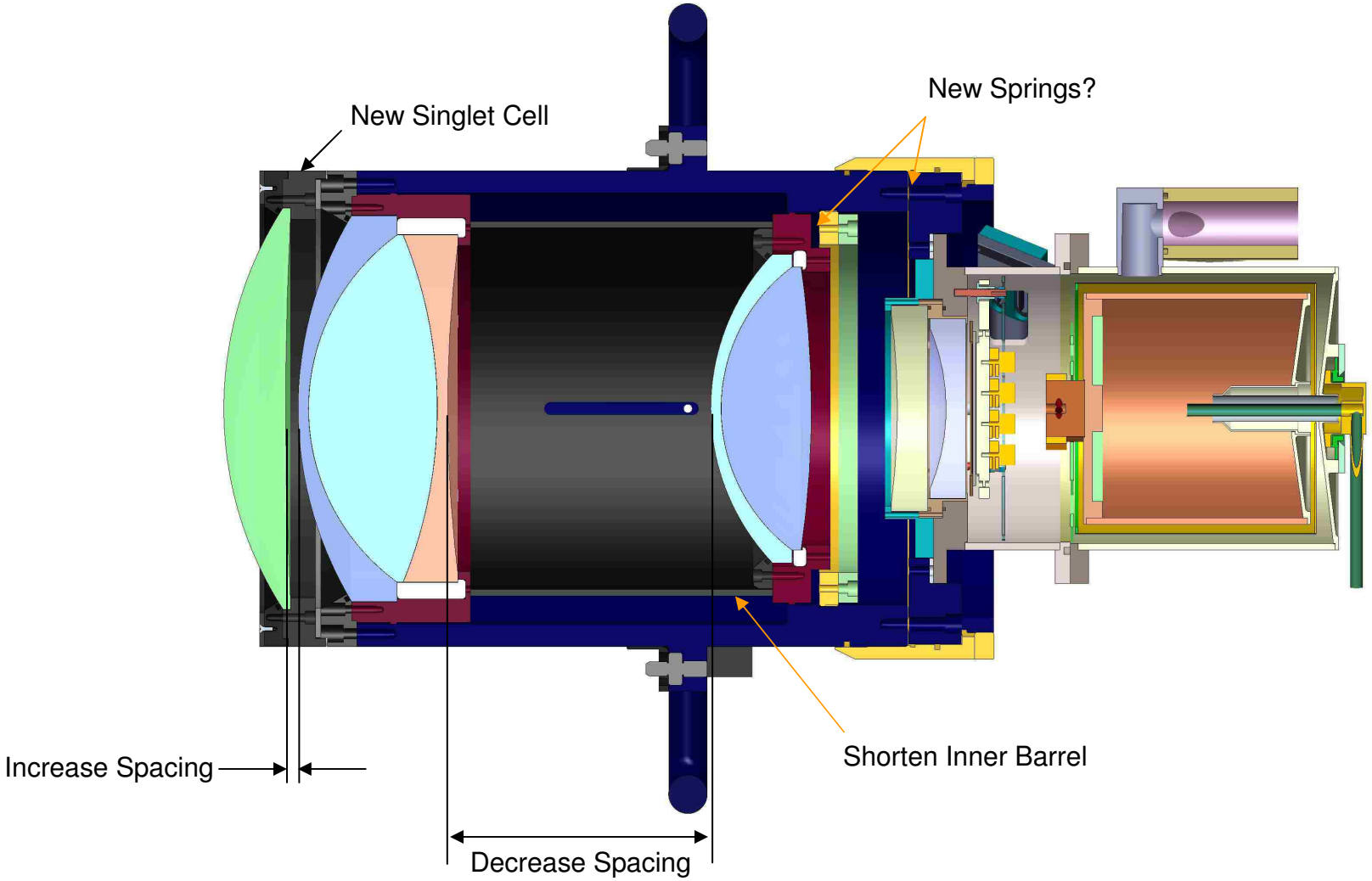
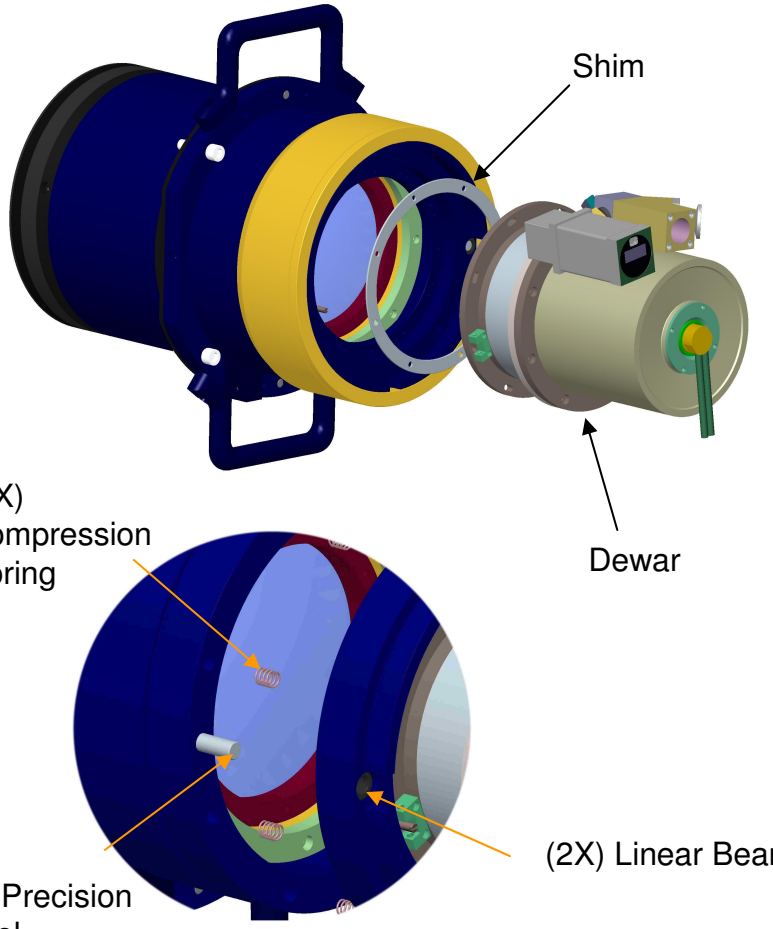
Central Optics Remaining Tasks

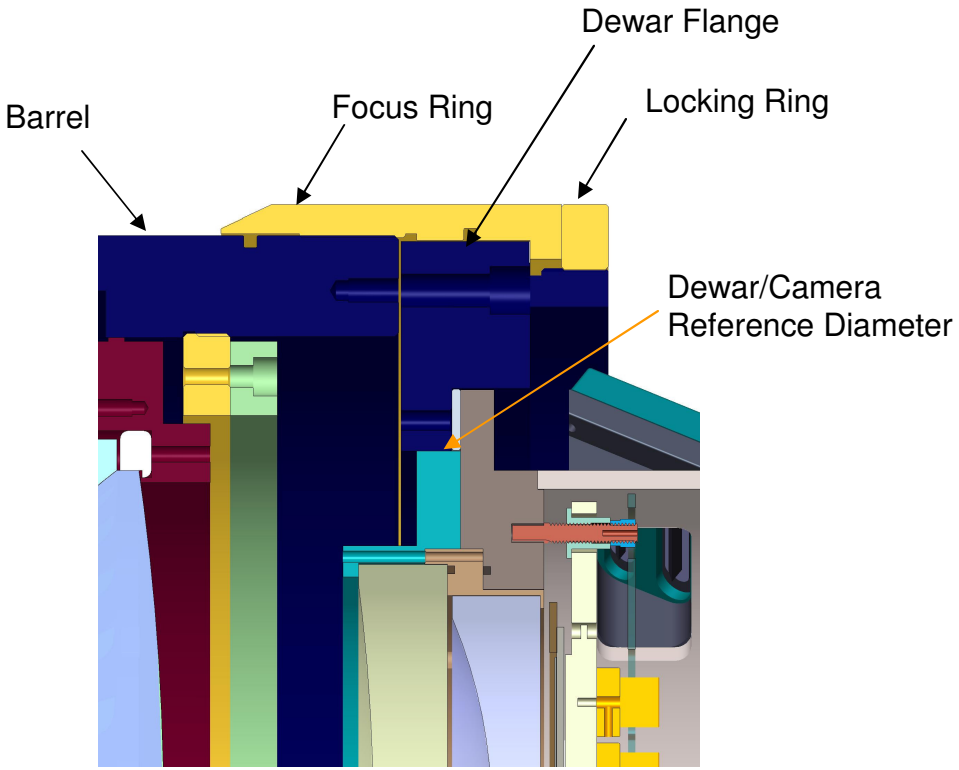
- Investigate spring plunger loads on the grisms to ensure that forces are adequate to constrain the heavier optics.
- Tweak central optics hardware if needed once the optical design is firmed up.
- Revise the drawing set as per the new design.
- Fabricate and assemble test-fit new hardware.
- Deliver to the mountain for integration.

Camera Opto-Mechanical Modifications



Camera/Dewar Interface





Camera Remaining Tasks

- Tweak the singlet cell thickness if needed once the optical design is firm.
- Tweak the inner barrel length if needed once the optical design is firmed up.
- Finalize the camera/dewar interface with Mike Carr and verify all spacings and centering tolerances are met.
- Make sure spring loads in the focus stage are adequately sized for the revised dewar mass/CG.
- Finalize fabrication drawings for new parts.
- Fabricate hardware and deliver to the mountain for integration.